under and the petioles allow drooping to occur. With the recurrence of thawing weather the blades expand and the leaf resumes its horizontal position. HANNIG[12] has found that the rolling of the leaf is due to a loss of imbibition water by the cell walls, and especially by the walls of the spongy parenchyma. The movements may be artificially induced by conditions which cause the cell walls to lose water and so allow a contraction of the walls to occur. The formation of ice, excessive transpiration, etc. are such conditions. The author is inclined to regard this as the first known instance of hygroscopic movements by living leaves. To the reviewer it seems that he has made a closer analysis of the cause of the movements, and his discovery consists in showing that while turgor variation is a prominent and accompanying feature, the real cause is the fluctuation in the content of imbibition water in the cell walls. It seems likely that many of the leaf movements which have hitherto been regarded as due to turgor changes may later be found to be caused by swelling and shrinkage of the cell walls. The author has not overlooked the fact that some leaves whose structure is apparently as well adapted to such movements as those of Rhododendron do not exhibit them.—RAYMOND H. POND.

Embryo sac of Nymphaea advena.—Miss SEATON[13] has examined the embryo sac of this species, giving an account of its earlier stages. Abundant material has enabled her to fill in some desirable details. The archesporium is distinguishable before the integuments begin to develop; and by division of the parietal cell and the epidermal cells the functioning megaspore becomes covered by a sterile nucellar cap six to ten cells deep. The sac develops a conspicuous tubular prolongation into the chalaza, and the fusion nucleus rests in the narrow connection between this chalazal haustorium and the broader micropylar portion of the sac. At the first division of this nucleus there is no wall (contrary to previous observation), and one of the daughter nuclei passes to the end of the chalazal tube. As before reported for the family, the proembryo is spherical and almost completely invested by endosperm. The monocotyledonous character of Nymphaeaceae is inferred, but no new evidence for it is advanced. This claim, which habitually accompanies the recent studies of Nymphaeaceae, is founded upon certain rigid preconceptions as to what constitutes a monocotyledon. It might be well for investigators of this group to try the effect of their work upon the rigidity of the old definitions.—J. M. C.

Araucarians of the Atlantic coastal plain.—BERRY[14] has called attention anew to the wide distribution of araucarians in the Mesozoic, especially as contrasted with their present very restricted range. A Mesozoic distribution of the

[12] HANNIG, E., Ueber hygroskopische Bewegungen lebender Blätter bei Eintritt von Frost und Tauwetter. Ber. Deutsch. Bot. Gesells. **26a**:151–166. 1908.

[13] SEATON, SARA, The development of the embryo sac of *Nymphaea advena*. Bull. Torr. Bot. Club **35**:283–289. *pls. 18, 19*. 1908.

[14] BERRY, EDWARD W., Some araucarian remains from the Atlantic coastal plain. Bull. Torr. Bot. Club **35**:249–260. *pls. 11–16*. 1908.

group from Greenland to Patagonia in the western hemisphere and from Spitzbergen to Cape Colony in the eastern is to be contrasted with its present occurrence in South America and the Australasian region. This means that araucarians have disappeared from North America, Europe, Africa, and practically all of Asia. Recent investigations in the Atlantic coastal plain show that the group not merely occurred in that region during the Mesozoic, but was abundant, perhaps the most abundant coniferous type of the older Mesozoic. From this region BERRY describes three new species: *Araucarites Zeilleri*, from New Jersey; *Araucaria bladenensis*, from North Carolina to Alabama; and *Araucaria Jeffreyi*, from North Carolina.—J. M. C.

Embryo sac and embryo of Urticaceae.—MODILEWSKY[15] has examined twelve genera of Urticaceae (Urtica, Elatostema, Laportea, Urera, Parietaria, Fleurya, Boehmeria, Dorstenia, Morus, Celtis, Cannabis, and Humulus), and finds that the embryo sac and embryo are in general of the ordinary dicotyledonous type. *Elatostema sessile*, *Dorstenia drakeana*, and *D. contrayerva* are said to be parthenogenetic, and *Celtis occidentalis* is chalazogamic. In the species of Dorstenia and in *Urtica cannabina* the antipodals multiply, but finally disappear. The polar nuclei fuse very early, and in Elatostema endosperm formation occurs without polar fusion. In *Urtica cannabina* a conspicuous antipodal haustorium is developed, and a much smaller one appears in *U. urens*. Many other details are recorded, but they are of no special significance.—J. M. C.

Black rot.—The black rot of the grape is the subject of a recent bulletin by REDDICK and WILSON,[16] which is mainly popular in nature, and is well illustrated and clear. The spores germinate on the vines only in the presence of water. Infection is noticeable after a period of twelve to twenty days, or upon the berry in eight to fourteen days. After discussing the control, it is stated that four acres, well sprayed, made a gain of 1662 pounds, equalling a saving of $32.95 per acre. It is recommended that mummied fruit be picked to avoid the spread of the disease, that the ground be turned over as completely as possible, to bury rotted berries, and that the vines be sprayed with Bordeaux mixture, as has been recommended heretofore.—F. L. STEVENS.

Leaves in autumn.—TSWETT summarizes the knowledge regarding the emptying of leaves in autumn thus.[17] It may be considered as settled that the nitrogenous compounds diminish and are carried back, proteolysis simplifying the proteins to this end; results as to phosphorus compounds are more contradict-

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[15] MODILEWSKY, JAKOB, Zur Samenentwicklung einigen Urticifloren. Flora **98**: 423–470. *figs.* 71. 1908.

[16] REDDICK, DONALD, and WILSON, C. S., The black rot of the grape, and its control. Cornell Univ. Agric. Exp. Sta., Bull. **253**:367–388. April 1908.

[17] TSWETT, M., Ueber die Verfärbung und die Entleerung des absterbenden Laubes. Ber. Deutsch. Bot. Gesells. **26a**:88–93. 1908.